

## **The Maury Project 2012 Annual Report**

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### **LONG-TERM GOALS**

The Maury Project is an oceanography-based, graduate-level, teacher professional development program designed to promote the scientific literacy of young people by improving the background of pre-college teachers on the physical foundations of oceanography. This is accomplished through a process of training the trainers at a two-week workshop held at the U.S. Naval Academy and subsequently via single-topic modules that Maury peer trainers present in sessions throughout the United States. By increasing the scientific knowledge of teachers, the Maury Project is ultimately directed towards attracting precollege students, including underrepresented minorities, to science, technology, engineering, and mathematics studies. This is in close alignment with the ONR mission to “nurture the next generations of researchers for the future of the Navy and Marine Corps.”

### **OBJECTIVES**

This project was designed to meet the following objectives:

- (a) Master teachers will be trained to be peer trainers and resource persons on the physical foundations of selected oceanographic topics and/or issues.
- (b) AMS will prepare and provide self-contained, single-topic, teacher-enhancement instructional modules for use by Maury peer trainers in 1- to 2-hour training sessions.
- (c) Maury peer trainers will arrange and conduct training sessions for other teachers, with support from the AMS.
- (d) AMS will develop and maintain a national network of oceanography peer trainers and resource persons.
- (e) AMS will prepare and disseminate a variety of instructional resource materials on the physical foundations of oceanography and related topics, which will be adapted by teachers for use in their own classrooms.

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## **APPROACH**

There are three major components to this program: an annual summer workshop for master pre-college teachers, the production of teacher enhancement instructional resource materials, and the peer-training of additional teachers. The intent is to provide a core group of teachers with the knowledge and instructional resources to enable them, in turn, to train a large number of their peers on selected oceanography topics. In-class use of these topics by those peer-trained will enhance learning experiences for K-12 students. Maury peer trainers receive three graduate-level credits through the State University of New York's College at Brockport upon completion of program requirements.

## **WORK COMPLETED**

In summer 2012, a two-week workshop for 24 pre-college teachers on the physical foundations of selected oceanographic topics was held at the United States Naval Academy in Annapolis, MD. The USNA Oceanography Department makes available to the Maury Project essentially all of its outstanding facilities for the workshop, including an oceanographic research vessel and the Hendrix Oceanography Laboratory, which features a NOAA Tide Station, and a wet laboratory, which circulates water from the Chesapeake Bay. Participants have an intensive, hands-on experience in oceanography, which they are excited to share with others via peer-training workshops they conduct in their local school districts and communities.

## **RESULTS**

End-of-workshop survey questionnaires are administered on the last day of each Maury Project summer workshop. Data collected at the end of the summer 2012 workshop is summarized below from the 22 participants who completed the survey. (Two participants could not complete the survey.)

When the 22 participants were asked for:

- their overall rating of the Maury Project in terms of its educational value, all 22 gave the highest response of “excellent.”
- the long-term effect on their teaching, 21 reported “great deal” and 1 “some.”
- the long-term effect on their curriculum development, 20 reported “great deal” and 1 “some”
- the long-term effect on training of colleagues, 21 reported “great deal” and 1 did not respond

When asked “Has your perception of the value of the Navy changed as a result of your workshop participation?” 21 reported “increased” and 1 reported “remained the same.”

When asked “Has your perception of the value of NOAA changed as a result of your workshop participation?” 17 reported “increased” and 5 reported “remained the same.”

When asked how they would rank the Maury workshop with other summer workshop experiences they have had since becoming a teacher, all participants indicated it was the best or among the very best.

When asked if they would recommend that the Maury Project USNA workshop be offered in the future to other teachers, all participants responded affirmatively.

With the training of 24 new participants in the summer 2012 Maury Project workshop, a total of 454 teachers representing all 50 states, the District of Columbia, Puerto Rico, American Samoa, Argentina, Guam, Mexico, South Africa, Canada, Great Britain, Australia, Switzerland, Japan, and the U.S. Department of Defense Overseas School System have become peer trainers since the first USNA summer workshop in 1994. These educators, in turn, have conducted about 2100 single-topic peer training sessions for tens of thousands of teachers. Additionally, the Maury Project alumni have provided significant leadership in pre-college ocean science education curriculum reform. About 30 Maury workshop alumni have played key roles in the development and national implementation of the graduate-level AMS *DataStreme Ocean* (2003-present), *DataStreme Water in the Earth System* (2001-2008), and *DataStreme Earth's Climate System* (2009-present) in-service teacher enhancement courses, which have trained thousands of other teachers.

## IMPACT/APPLICATIONS

Maury Project summer workshop participants are committed to offering a minimum of two single-topic training sessions lasting from one to two hours each. The table below lists workshops conducted over the past three years. Summer 2012 participants will conduct their required workshops during School Year 2012-2013.

### *Peer-training Workshops Conducted from 1 April 2009 – 30 September 2012*

Summer Workshop Group	Number of Peer-Training Workshops	Teachers Peer-Trained
Summer 2009	45	506
Summer 2010	42	305
Summer 2011*	35	421
Groups Prior to 2009**	33	416
*Summer 2011 participants are still completing their required 2 peer-training workshops.		
**Several past participants continue to actively conduct workshops, well beyond the required number.		

To see the multiplying effect of this program, consider that since its inception about 2100 workshops have been conducted by Maury peer trainers across the country, reaching over 33,000 teachers, each of whom reaches about 100 students daily.

## TRANSITIONS

Beginning in spring 2004, Maury Project alumni have played major roles in the development and implementation of *DataStreme Ocean*, a semester-long teacher enhancement course that is being offered nationwide by the AMS with NOAA support. Maury Project alumni lead approximately 17 Local Implementation Teams (LITs) for the course. Through spring semester 2012, a total of 3388 pre-college teachers were trained by this program. Approximately 120 teachers are taking *DataStreme Ocean* this fall.

Originally funded by the NSF for 3 summers starting in 1994, the existing Maury Project Summer Workshops at the Naval Academy received additional NOAA, Navy, and AMS support. Funding from ONR assures the continuation of the workshops through summer 2013. ONR has committed substantial support towards this continuation and is now its major sponsor.

## **RELATED PROJECTS**

### ***AMS Ocean Studies***

Building on the experiences gained in the Maury Project and the *DataStreme Ocean* distance-learning teacher enhancement course, the AMS developed an introductory college-level oceanography course, entitled *AMS Ocean Studies*. Since national implementation in fall 2005, 152 undergraduate institutions and 19 high schools have offered the course to more than 18,000 students. *AMS Ocean Studies* would not exist without the experiences gained from the Maury Project, including materials development. A major benefit of the *AMS Ocean Studies* course is that it is reaching hundreds of pre-service pre-college teachers.

### ***AMS Diversity Projects***

The *AMS Ocean Studies* Diversity Project, an offshoot of our work with the *AMS Ocean Studies* undergraduate course, was a direct result of an NSF grant and NOAA support to provide special workshop opportunities for faculty at institutions serving significant numbers of minority students. Workshops were held each summer at University of Washington and NOAA facilities in Seattle, WA from 2006-2008. The 77 minority-serving institutions (MSIs) participating in the program have offered the course to well over 5000 students, providing an opportunity to sample an oceanography course where none existed prior to this program.

AMS received an NSF OEDG Track 2 grant in August 2011 to continue Diversity Project workshops, this time focusing on implementation of the *AMS Climate Studies* course at 100 MSIs over a five-year period. For many participating faculty members, the Climate course will accompany the offering of the *AMS Ocean Studies* and/or *AMS Weather Studies* course at their institution. At the May 2012 *AMS Climate Studies* course implementation workshop, RADM David Titley gave an informative presentation entitled “Climate Change and the U.S. Navy.”

### ***COSEE Partnership***

In early 2011, AMS and Centers for Ocean Sciences Education Excellence (COSEE), another ONR supported program, signed a Memorandum of Understanding “to promote atmospheric and oceanic science research, education, and outreach and cooperation and action.” This MOU is creating new avenues of outreach and educational opportunities for potential and current teacher participants. Historically many Maury Peer Trainers have also been involved with COSEE at a variety of levels, including several in leadership positions.

### ***Consortium for Ocean Leadership Partnership***

In fall 2010 and spring 2011, PI Brey attended School of Rock workshops for educators on the *JOIDES Resolution* ocean-drilling ship. At the 2011 workshop, Brey presented the idea for formal collaboration on a grant to bring minority-serving institution faculty members who offer *AMS Ocean Studies* and/or *AMS Climate Studies* to a special School of Rock. The goal is to train MSI faculty to infuse curricula involving paleoclimate data from ocean cores, thereby providing MSI students with opportunities to

use real research data in the classroom. The idea came to fruition in 2012 when Consortium for Ocean Leadership was awarded an NSF OEDG planning grant to collaborate with AMS and other partners. The School of Rock workshop was held at the Texas A&M University Gulf Coast Repository in June 2012 for 12 MSI faculty, and the group is planning a more extensive grant submission.

## **PUBLICATIONS AND PRESENTATIONS**

### ***1 October 2011 – 30 September 2012:***

1. 16,000 Teachers and Counting: Improving the Competence and Confidence of Pre-college Teachers through AMS Professional Development Courses

GSA Annual Meeting, Minneapolis, Minnesota

October 11, 2011

Oral Presenter: Maureen Moses

[https://gsa.confex.com/gsa/2011AM/finalprogram/abstract\\_191366.htm](https://gsa.confex.com/gsa/2011AM/finalprogram/abstract_191366.htm)

2. AMS Professional Development Programs: A Geoscience Foundation for Pre-college Educators

AAG Annual Meeting, New York City, NY

February 26, 2012

Oral Presenter: Kira Nugnes

<http://meridian.aag.org/callforpapers/program/AbstractDetail.cfm?AbstractID=45854>

3. The AMS Education Program: 20 Years of Contributing to Earth Science Literacy

Texas Community College Teachers Association – 2012 Convention, Dallas, TX

March 2, 2012

Oral Presenters: Jim Brey

4. AMS Professional Development - A Geoscience Foundation for K-12 Educators

NSTA National Conference, Indianapolis, IN

March 30, 2012

Oral Presenter: Jim Brey